

Integrated Science 4999E: Integrated Research Project

Course Outline: Fall/Winter 2021/22

Welcome to IS 4999E! You have reached your culminating research project for your degree at Western! This course will provide you with the opportunity to engage in novel research under the supervision of a faculty member in your chosen discipline. During this course, you will shadow your discipline's fourth year thesis course while also submitting and completing integrated science components.

1. Course Information

Course Title:	Integrated Science 4999E – Integrated Research Project
Lecture Section:	001
Description:	A major experimental or theoretical project that integrates at least two scientific disciplines. Key aspects of the project will include experimental design, instrumentation, collection and analysis of data, and communication of results. Projects require co-supervision by at least two faculty members, at least one of whom must be from the Faculty of Science.
Prerequisites:	Enrolment in Year 4 of the Western Integrated Science program.
Antirequisites:	Biology 4970F/G, Biology 4999E, Chemistry 4491E, Earth Sciences 4490E, Computer Science 4490Z, Physics 4999E.
Credits:	1.5
Lecture Times:	Fridays 3:30 – 4:30 pm (see section 11)
Delivery Type:	In-Person Contingency plan for an in-person class pivoting to 100% online learning In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will not change. Any remaining assessments will also be conducted online as determined by the course instructor. Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Instructors/ Facilitators:	Dr. Christina Booker Integrate Science/ Chemistry Office: CHB 21/off-campus cbooker2@uwo.ca	Dr. Gurpaul Kochhar Integrated Science/ Chemistry Office: MSA 1201 gkochhar@uwo.ca
Email Response:	We will strive to respond to your email within 24 hours on weekdays, but please allow up to 48 hours for a response. Please use your @uwo.ca email address and specify "IS4999E" within the subject of your email. Please send all emails to Dr. Kochhar at gkochhar@uwo.ca	
Office Hours:	By appointment. Please email your instructor(s) to make an appointment over Zoom.	

3. Course Website

Our course site can be found through <http://owl.uwo.ca> and will be used for:

- Announcements
- Submitting work
- Discussion
- Accessing course components

Students should check OWL on a regular basis for news and updates. This is the primary method by which information will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis. For technical issues or questions regarding OWL, please contact Western Technology Services (WTS) through https://wts.uwo.ca/get_help/index.html.

4. Required Course Materials

There are no required materials for this course.

5. Course Overview and Learning Outcomes

This capstone course gives you the opportunity to engage in an experimental or theoretical research project with interdisciplinary science components or applications. During this learning experience, you will design experiments, learn how to operate new instrumentation/programs, collect and analyze data, and communicate these results in a form report and presentation. This course grants you a new level of freedom to explore and research a new scientific area under the guidance of science faculty member.

By the end of this course, students should be able to:

- Apply scientific knowledge to a novel, interdisciplinary research project
- Propose creative, testable hypothesis and experimental designs
- Critically evaluate collected data and experimental approaches
- Discuss any limitations to data, experimental approaches, and assumptions
- Discuss interdisciplinary applications and considerations for a research project
- Communicate scientific research findings effectively and confidently both orally and in writing to academic and general audiences
- Integrate constructive criticism to improve research methodology and presentation

6. Assessments

Your grade for this course will be calculated by your departmental mark (from your discipline's fourth year thesis course) and WISc components. The departmental mark will speak to the requirements of your home department; the WISc mark will emphasize the interdisciplinary nature of your project. This arrangement ensures that you develop and highlight the interdisciplinary components of your work.

Assessment Component	Deadline	Weight
Home Discipline Deliverables		80%
Course Grade as calculated from your discipline's fourth year thesis course	Dates specified by your department	80%
Interdisciplinary WISc Components		20%
Registration Form and Proposal/Abstract	Sept 24 th 5 pm	3%
Mid-year Review	Dec 8 th 5 pm	6%
Poster Presentation	March 25 th (in-class*)	11%

*Class time will be extended on this day, or an alternative, mutually agreeable date and time will be determined.

7. Home Discipline Deliverables

By enrolling in IS4999E, you are also shadowing your home discipline's fourth year thesis course. You will engage in all of the activities, deliverables and due dates from your home discipline. Your final course grade from your home discipline will account for 80% of your IS4999E grade. If you have any questions or concerns with any of these components, first speak to your disciplinary faculty coordinator or research supervisor. If a problem persists, reach out to Dr. Booker or Dr. Kochhar.

8. Interdisciplinary WISc Components

The integrated components for this course are not meant to add to your workload, but to foster critical thinking and applications of your research in an interdisciplinary context. Some of these components will also overlap with deliverables that will be set by your discipline.

Registration Form and Proposal/Abstract

Registration form: Complete the template form provided on OWL, including the name and contact information for your supervisors, co-supervisors, advisors, and any other individuals involved in your thesis project and the title of your project. If your discipline already has a form with similar content expectations, you can simply upload a copy of that form as your registration form to our OWL course site. This is graded for completion. You must also submit a PDF copy of the course outline for your disciplinary fourth year thesis course.

Proposal/Abstract: Prepare an outline of your proposed research project. The length should be one generous paragraph to one-page, 1.5 line spacing. This deliverable is likely already a requirement for your discipline, but this submission for IS 4999E must *also* speak to the **interdisciplinary** nature or applications of your work.

Registration Form and Proposal/Abstract Components	Grade
Registration Form – complete	/1
Attach the course outline for your disciplinary fourth year thesis course	/1
Proposal/Abstract – clear, informative outline of proposed research project	/4
Proposal/Abstract – interdisciplinary nature and applications are thoughtfully discussed	/4
Total Grade	/10

Mid-Year Review

Prepare an update of your achievements on your research project. This may be your introduction and/or literature review, depending upon your disciplinary course expectations for their mid-year review. You may submit a duplicate of the required mid-year review for your disciplinary course. If the following components are not present in your disciplinary submission, please also submit an additional paragraph/page discussing:

- how your current progress compares to your initial proposal/abstract
- how the interdisciplinary nature/ applications of your work have remained the same or changed
- what you anticipate being able to accomplish within the time remaining on your thesis
- any other relevant information you wish us to know

The due date for this mid-year review is 3-days after your discipline's due date (including weekends).

Mid-Year Review	Grade
Disciplinary Expectations (Introduction/Literature Review/Presentation/Other)	/3
Detailed discussion of your research progress and anticipated next steps. Comparison of current progress to initial proposal/abstract. (This could be included in the disciplinary expectation)	/3
Discussion of how the interdisciplinary nature/ applications of your work have progressed (This could be included in the disciplinary expectation)	/3
Engagement at IS 4999E check-in meetings	/1
Total Grade	/10

Poster Presentation

Design an electronic poster for a general science audience (ie. your colleagues in WISC who have a science background but are not necessarily specialists in your field) to explain the importance of your research project. This poster presentation should discuss the background information around your project, your particular experiments/ contributions, and the interdisciplinary nature/applications of your project.

Poster Presentation	Grade
The interdisciplinary nature and/or applications are highlighted and embedded throughout the presentation	/6
Background and context for this research project are clearly communicated for a general science audience	/5
Research contributions are explained for a general science audience	/5
Poster is organized, visually appealing, and balances text and images/headings	/3

Oral presentation of the poster captures the audience attention and guides audience through main poster points	/3
Grammar, spelling, and textual flow are easy to follow	/2
References	/1
Total Grade	/25

9. Tips for Success

Performing research is a new learning experience for most students. In order to have a successful year, we suggest the following:

- Seek help when you have questions or concerns. Don't just hold onto your questions – especially if they are about safety! Speak to your research supervisor, disciplinary course coordinator, Dr. Kochhar or Dr. Booker if you have questions or concerns.
- Prepare for any research meetings you have with your group or supervisor. Be ready to share your progress and any questions you have about the next steps of your project.
- Work diligently on your research each week. Plan to dedicate 10-15 hours in the lab or online to make progress on your project.
- Begin your written/presentation deliverables early! These tasks often take more time than you anticipate – especially if this is the first time you are completing this type of task. Give yourself time to brainstorm, write, edit, and reflect.
- Engage with the research members in your team. Use this opportunity to find out about their research and goals and to reflect upon your possible future in research.
- Attend and engage in the monthly integrated science meetings for this course to develop your integrated research perspective.

Again, if you have any questions or concerns along the way – reach out right away.

10. Course Policies

Written components for WISc: Please submit your written work on OWL within three days of the due date of your disciplinary course, or by the dates indicated in the assessment table. If extenuating circumstances apply, please email Dr. Booker or Dr. Kochhar to discuss your submission. If an extension is not granted and you are unable to submit these deliverables by the given time, you must either self-report or provide the proper documentation to your academic advisor supporting the reason for your request and notify your instructors immediately. If you self report, your due date will automatically be extended to 24-hours after your 48-hour self-report concludes (including weekends).

WISc Poster Presentation: If you are unable to present your poster on the designated Poster Day (date TBA), please email Dr. Booker or Dr. Kochhar to discuss alternative arrangements. If an extension is not granted and you are unable to present your poster on Poster Day, you must either self-report or provide the proper documentation to your academic advisor supporting the reason for your request and notify your instructors immediately. If you self report, your due date will automatically be extended to 24-hours after your 48-hour self-report concludes (including weekends).

11. Course Schedule

Below is the schedule of meeting times for the course.

Class	Date
1	September 17 th
2	October 15 th
3	November 19 th
4	January 14 th
5	March 11 th
6	March 25 th (Poster presentations)* (Class time will be extended, or an alternative date will be announced.)

12. University Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy, <http://www.uwo.ca/its/identity/activatenonstudent.html>, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

Academic Consideration for Student Absence

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the semester, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student's final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are *not* met, students will need to provide a Student Medical Certificate if the absence is medical, or provide appropriate documentation if there are compassionate grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All**

documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.

For policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs, see:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf

and for the Student Medical Certificate (SMC), see:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

Masking Guidelines

Students will be expected to wear triple layer, non-medical, paper masks at all times in the classroom as per University policy and public health directives. Students who are unable to wear a mask must seek formal accommodation through Western Accessible Education, and present medical documentation. Students are not permitted to eat or drink while in class to ensure masks stay in place. Students will be able to eat and drink outside of the classroom during scheduled breaks. Students unwilling to wear a mask as stipulated by Western policy and public health directives will be referred to the Dean, and such actions will be considered a violation of the student Code of Conduct.

Course Absences due to Daily COVID Screening Questionnaire:

Missed assessments (e.g., presentations, essays, quizzes, tests, midterms, etc.) require formal academic considerations (typically self-reported absences and/or academic counselling). Methods for dealing with missed work and course content are at the discretion of the instructor(s). Students should be aware that some learning outcomes cannot be easily made up and may need to be completed in a subsequent year. Your instructor will provide you with further information as to how this applies within this course. Students who demonstrate a pattern of routinely missing coursework due to self-reported COVID symptoms, and therefore do not demonstrate mastery of the learning outcomes of the course, will not receive credit for the course.

Religious Accommodation

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar:

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

13. Academic Integrity

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

This course includes creative and written submissions. Be sure to cite all references and sources and complete your own work. If you have a question on whether or how to cite a source, ask your instructor!

Turnitin: All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

14. Accessibility

Please contact the instructors if you require material in an alternative format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education (AE) at 661-2147 if you have questions regarding accommodation.

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf

15. Support Services

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>

Learning-skills counsellors at the Student Development Centre (see link below) are ready and willing to help you improve your learning skills in the course. They offer strategies for improving time management, exam preparation, and study skills. Individual support is offered September – April in the drop-in Learning Help Centre and year-round through individual counselling:

https://www.studentexperience.uwo.ca/student_development/index.html

Students who are in emotional/mental distress should refer to Mental Health@Western (http://www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>

16. Feedback

We value your feedback. Please feel free to provide feedback to your instructors in-person, email, or through OWL. Your feedback is welcomed and will remain confidential.